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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/788,432

02/27/2004

Aaron D. Peacock

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SALIWANCHIK LLOYD & SALIWANCHIK  
A PROFESSIONAL ASSOCIATION  
PO Box 142950  
GAINESVILLE, FL 32614

EXAMINER

SALMON, KATHERINE D

ART UNIT

PAPER NUMBER

1634

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/788,432	<b>Applicant(s)</b> PEACOCK ET AL.	
	<b>Examiner</b> KATHERINE SALMON	<b>Art Unit</b> 1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-14, 16-23 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-14, 16-23, 25-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is in response to the papers filed on 10/20/2008.
2. Claims 1-6, 8-14, 16-23, 25-30 are pending. Claims 7, 15, and 24 have been cancelled.
3. The following rejections are newly applied.
4. This action is Non-FINAL.

### **Withdrawn Rejections and Objections**

5. The claim objections made in section 5 of the previous office action are moot based upon amendments to the claims.
6. The rejection of Claim 20 under 35 USC 112/2<sup>nd</sup> made in section 6 of the previous office action is moot based upon amendments to the claims.
7. The rejection of the claims under 35 USC 103(a) made in section 9-10 of the previous office action is withdrawn based on arguments set forth in the reply.  
Specifically adhesion deficient gram negative colonies would not be grown on a solid support.

8. Claims 6 and 14 are objected to because of the following informalities: These claims contain reference to a table. MPEP 2173(s) states "Where possible, claims are to be complete in themselves. Incorporation by reference to a specific figure or table is permitted only in exceptional circumstances where there is no practical way to define the invention in words and where it is more concise to incorporate by reference than

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duplicating a drawing or table into the claim. Incorporation by reference is a necessity doctrine, not for applicant's convenience." Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-6, 8-14, 16-18, 21-22, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p.

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1015) in view of Wick et al. (Environmental Microbiology 2003 Vol. 5 p. 612) and Peyton et al. (US Patent 5641642 June 24, 1997).

With regard to Claim 1, Avao et al. teaches a method of detecting at the site changes in soil bacteria and fungal activities (e.g. bioremediation) by measurement of the incorporation of  $^{13}\text{C}$  into phospholipids fatty acids (PLFA) (abstract). With regard to step a, Avao et al. teaches contacting a community at a soil site with  $^{13}\text{C}$  labeled acetate (p. 1016 1<sup>st</sup> column last two paragraphs). With regard to step c, Avao et al. teaches identifying biomarkers (e.g. phospholipids) in which the  $^{13}\text{C}$  label was incorporated (p. 1016 1<sup>st</sup> column last two paragraphs and 2<sup>nd</sup> column 2<sup>nd</sup> full paragraph). With regard to step d, Avao et al. teaches the measurement of PLFA indicates microbial growth in the soil (1<sup>st</sup> paragraph) and therefore indicates that detection of microbes known to cause bioremediation because the presence of bacteria and fungi in the soil indicate that the soil sample contains living organisms (p. 1016 3<sup>rd</sup> paragraph).

With regard to Claims 2-3, Avao et al. teaches that the biomarkers are phospholipids (abstract).

With regard to Claims 4-5, Avao et al. teaches that the detection of these fatty acids are found in Gram-negative bacteria and only a small amount of Gram-positive bacteria therefore the biomarkers would detect a subset of microbial organisms (p. 1018 1<sup>st</sup> column last paragraph).

With regard to Claim 6, Avao et al. teaches the isotope of  $^{13}\text{C}$  (abstract).

With regard to Claim 8, Avao et al. teaches a method of identification of PFLA analysis (abstract).

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With regard to Claim 9 step a, Avao et al. teaches contacting a community at a soil site with  $^{13}\text{C}$  labeled acetate (p. 1016 1<sup>st</sup> column last two paragraph). With regard to step c, Avao et al. teaches identifying biomarkers (e.g. phospholipids) in which the  $^{13}\text{C}$  label was incorporated (p. 1016 1st column last two paragraphs and 2nd column 2nd full paragraph). With regard to step d, Avao et al. teaches the measurement of PLFA indicates microbial growth in the soil (1<sup>st</sup> paragraph) and therefore indicates that detection of microbes.

With regard to Claims 10-11, Avao et al. teaches that the biomarkers are phospholipids (abstract).

With regard to Claims 12-13, Avao et al. teaches that the detection of these fatty acids are found in Gram-negative bacteria and only a small amount of Gram-positive bacteria therefore the biomarkers would detect a subset of microbial organisms (p. 1018 1<sup>st</sup> column last paragraph).

With regard to Claim 14, Avao et al. teaches the isotope of  $^{13}\text{C}$  (abstract).

With regard to Claim 16, Avao et al. teaches a method of identification of PFLA analysis (abstract).

However, Avao et al. does not teaches a method of contacting the microbial community in ground water with a sterile solid support that has be loaded with the  $^{13}\text{C}$  labeled acetate (step a) or incubating the solid support at the site for a period of time to establish a biofilm (step b).

With regard to Claims 1 and 9, Wick et al. teaches that PLFA analysis can be performed on water samples to determine the bioavailability of particular growth

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substances (abstract). Wick et al. teaches that these profiles of PLFA obtained from water samples indicate changes in the microbial community of the water (p. 672 2<sup>nd</sup> column 1<sup>st</sup> paragraph). Therefore Wick et al. teaches the same PFLA analysis can be performed on water samples to determine the bioavailability of growth substances.

With regard to Claim 1 and 9, Peyton et al. teaches a device which permits biofilm forming microorganism to adhere to packing material (e.g. solid support) in order to analyze the microorganisms at groundwater and subsurface sites (abstract and column 1 lines 15-25).

With regard to Claims 17-18 and 21-22, Peyton et al. teaches detection of microbes at groundwater or subsurface sites (column 1 lines 15-25).

With regard to Claims 25 and 28, Peyton et al. teaches that solid support comprises a perforated tube (Column 2 lines 10-11) which the acetate of Arao et al. would be loaded into in order to incorporate the <sup>13</sup>C label into the sample.

With regard to Claims 26 and 29, Peyton et al. teaches that the tube comprises glass fibers or glass beads (column 2 lines 19-20).

With regard to Claims 27 and 30, Peyton et al. teaches incubating the tube for a period of time to establish a biofilm (abstract).

Therefore it would be prima facie obvious for one of skill in the art at the time of filing to modify the method of detecting biomarkers labeled with isotopes to detect microorganisms in soil samples as taught by Arao et al. to be used in water samples to detect growth changes in microorganisms as taught by Wick et al. The ordinary artisan would be motivated to detect the water samples as taught by Wick et al. in order to

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determine growth changes in the microbial community of the water (p. 672 2<sup>nd</sup> column 1<sup>st</sup> paragraph). Therefore the ordinary artisan would perform PFLA analysis to determine the bioavailability of growth substances in water at sites of interest. The ordinary artisan would be motivated to detect these water samples at the site using the method of Peyton et al. to produce biofilms of the microorganisms at the site of detection. The ordinary artisan would be motivated to detect at the site in order to determine the census of microbial growth at bioremediation sites in order to accurately know the optimal nutrients for growing desired organisms at the site of interest (column 1 lines 23-27).

11. Claims 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015) in view of Wick et al. (Environmental Microbiology 2003 Vol. 5 p. 612) and Peyton et al. (US Patent 5641642 June 24, 1997) as applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and further in view of Alexandrino et al. (Applied and environmental Microbiology October 2001 Vol 67 p. 4796).

The combination of Arao et al, Wick et al, and Peyton et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach labeling the biomarker with <sup>2</sup>H.

With regard to Claims 19 and 23, Alexandrino et al. teaches that <sup>2</sup>H can be used as a tracer for PFLA analysis (abstract).



Therefore it would have been prime facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Arao et al, Wick et al., and Peyton et al. to include a label of  $^2\text{H}$  on the biomarker for PFLA analysis as taught by Alexandrino et al.. It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from a finite number of predictable isotope labels for the biomarker including  $^2\text{H}$  with a reasonable expectation of success of labeling the biomarker in PFLA analysis for detection of the polylipids in the sample. Further Alexandrino et al. teaches that a use of  $^2\text{H}$  for labeling is that there are a large number of compounds of  $^2\text{H}$  available, the isotopes are less expensive, and the relatively low natural background of deuterium is beneficial for detection (p. 4796 2nd column 1<sup>st</sup> paragraph).

12. Claims 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arao et al. (Soil biology and biochemistry Vol. 31 1999 p. 1015) in view of Wick et al. (Environmental Microbiology 2003 Vol. 5 p. 612) and Peyton et al. (US Patent 5641642 June 24, 1997) as applied to Claims 1-6, 8-14, 16-18, 21-22, and 25-30 and further in view of Kharlamenko et al. (Marine Ecology 2001 Vol. 220 p. 103).

The combination of Arao et al, Wick et al, and Peyton et al. teaches a method of contacting a microbial community at a subsurface or down well groundwater site with a solid support loaded with an isotope enriched substrate, incubating, and identifying biomarkers. However the combination does not teach labeling the biomarker with  $^{34}\text{S}$ .

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With regard to Claims 19 and 20, Kharlamenko et al. teaches that  $^{34}\text{S}$  can be used as a tracer for biomarkers (abstract).

Therefore it would have been prime facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Arao et al, Wick et al., and Peyton et al. to include a label of  $^{34}\text{S}$  on the biomarker for PFLA analysis. It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from a finite number of predictable isotope labels for the biomarker including  $^{34}\text{S}$  with a reasonable expectation of success of labeling the biomarker in PFLA analysis for detection of the polylipids in the sample.

### ***Conclusion***

11. No Claims are allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Salmon whose telephone number is (571) 272-3316. The examiner can normally be reached on Monday-Friday 8AM-430PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine Salmon/  
Examiner, Art Unit 1634

/Juliet C Switzer/  
Primary Examiner, Art Unit 1634